SUMMARY OF THE OFFICE ACTION

3). Claims 17-20 have been rejected under 35 U.S.C. 101 as the claim structure is asserted to lack identifiable patentable utility.

4) Claims 1-20 have been rejected under 35 USC 103(a) as unpatentable over U.S. Patent No. 5,841,520 (Taniguchi) in view of U.S. Patent No. 5,969,441 (Loopstra).

RESPONSE AND ARGUMENTS REGARDING THE REJECTIONS

1). Claims 17-20 have been rejected under 35 U.S.C. 101 as the claim structure is asserted to lack identifiable patentable utility.

The claims have been amended as proposed by the Examiner.

2) Claims 1-20 have been rejected under 35 USC 103(a) as unpatentable over U.S. Patent No. 5,841,520 (Taniguchi) in view of U.S. Patent No. 5,969,441 (Loopstra).

This rejection is respectfully traversed. Because of the size and detail in the Taniguchi reference, a Table is provided below showing a term-by-term comparison of the subject matter of claim 1 of the present application and quoted text from Taniguchi from the PTO cited portions of that reference.

CLAIM 1	TANIGUCHI 5,841,520	COMMENTS
1. A method for measuring linear spot velocity or spot position variations in a scanning system comprising:		
a) providing at least two radiation detectors that can move in tandem across a scan line, the two radiation detectors being spaced apart by a distance **d**;	"The position of the reticle stage RST in the scanning direction is measured by the interferometer 7 at a unit of, for example, 0.01μm. The result of measurement by the interferometer 7 is fed to a stage controller 13 so that the reticle stage RST is always positioned with a high degree of accuracy." "A laser beam from an interferometer 9 is reflected by the movement mirror 8, and a reflected light beam is detected by the interferometer 9. Thus the position of the wafer stage WST in a coordinate system in the XY plane (hereinafter referred to as "wafer stage coordinate system") is always	**Taniguchi has two interferometers (radiation detectors), but neither "move in tandem across a scan line." The position of the "reticle stage" (RST) is measured by interferometer 7, and the position of the "wafer stage" (WST) is measured by interferometer 9.**

	monitored."	
b) positioning the at least two radiation detectors at a first point on the scan line;	a combining system for combining signals outputted from the photoelectric detector during a period in which the light-receiving section is scanned across the exposure area in synchronization with scanning for the mark pattern across the illumination area; and	**As noted above, neither radiation measuring detector is positioned at a point along a scan line. Rather, they are positions at the ends of the RST and the WST.**
c) scanning the at least two radiation detectors with scanning radiation and recording the position of the two detectors along the scan line and the time taken for the scanning radiation to scan from a first of the at least two radiation detectors to a second of the at least two radiation detectors while the at least two radiation detectors are positioned at the first point;	The position of the pattern plate 54 is adjusted by the Z-directional position sensor (10, 11) and the wafer stage WST so that the upper surface of the pattern plate 54 is coincident with the image plane of the projection optical system PL. When the image formation characteristics of the projection optical system PL are previously measured, the wafer stage WST is moved in the X direction so that the pattern plate 54 is located just under the projection optical system PL. Accordingly, an image of a pattern on the reticle R illuminated with the illuminating light beam IL is formed on the pattern plate 54 through the projection optical system PL. A slit-shaped aperture 51 is formed at a central portion of the pattern plate 54. The photoelectric sensor 55 for measuring the intensity of the illuminating light beam passed through the aperture 51 is installed inside the wafer stage WST and under the pattern plate 54.	**The position of the "detectors" is not determined, but rather the position of the WST and RST are determined. This process is for "performing exposure while synchronously scanning a reticle R and wafer W with respect to an illumination area on the reticle R.** **The method of Taniguchi is not for "measuring linear spot velocity or <u>spot</u> position variations" as recited in the claims. The device and process of Taniguchi does not measure the position or velocity of the spot, but looks at the physical alignment of a wafer and a reticule.**
d) moving the at least two radiation detectors to a second point on the scan line		**As the detectors (7, 9) of Taniguchi are not directed towards a spot, and only a**

maintaining the distance **d** between the at least two radiation detectors; and		**single receiver (53) is present, which (the Rejection asserts) can receive radiation from the RST detector 7 and WST detector 9 at the same time (this is not accepted as fact), the detectors cannot be moved as both detectors 7, 9 and the receptor 53 are fixed.**
e) again scanning the at least two radiation detectors with scanning radiation and recording the position of the two detectors along the scan line and the time taken for the scanning radiation to scan from a first of the at least two radiation detectors to a second of the at least two radiation detectors while the at least two radiation detectors are positioned at the second point.		**Again, as Taniguchi does not record the position of detectors along a scan line in a first instance, they cannot "again" scan and record the position of detectors.**

As can be seen from the word by word analysis of the subject matter of claim 1 and the disclosure of Taniguchi, there is far greater difference between the underlying disclosure of Taniguchi and the claimed subject matter of claim 1 than the stated differences of:

"two radiation detectors being spaced apart by a distance **d**."

The entire underlying structure, purpose and function if Taniguchi has been shown to be different from the claimed process of Claim 1 in numerous and substantive ways. The actual disclosure of Taniguchi in other areas of the specification are cited below with **highlighting** to emphasize the actual differences of Taniguchi from the claimed subject matter.

Taniguchi actually describes methods as:

"According to a fourth aspect of the present invention, there is provided a scanning type exposure method comprising scanning a mask across an illumination area on the mask while illuminating the mask, **and scanning a photosensitive substrate across an exposure area which is conjugate to the illumination area in relation to a projection optical system**, in synchronization with the scanning for the mask so that the photosensitive substrate is exposed with a pattern on the mask through the projection

optical system, the scanning type exposure method comprising **scanning a light-receiving section of a photoelectric detector in place of the photosensitive substrate in synchronization with scanning for the mask before the photosensitive substrate is exposed with the pattern on the mask, the photoelectric detector being provided for detecting an image of a mark pattern formed on the mask, combining signals outputted from the photoelectric detector during the scanning to determine the image of the mark pattern on the mask during the scanning, and computing image formation characteristics of the projection optical system on the basis of the obtained image of the mark pattern**. According to this method, the image of the test pattern on the mask can be formed under a condition of actual scanning exposure, i.e., a dynamic condition in which the mask stage and the substrate stage are moved, and thus the image formation characteristics can be determined. Accordingly, it is possible to previously know the difference between the image formation characteristics upon actual exposure and image formation characteristics determined in a state in which the mask stage and the reticle stage stand still. Therefore, the image formation characteristics measured under the dynamic condition can be corrected, for example, by adjusting the movement velocity of the stage."

The above description of the purpose and operation of the Taniguchi system by the reference itself is substantively different from being able to determine the speed or position of a dot at any time during the actual scanning of image so that the final image data may be reviewed and a real correction of the data performed on the basis of the recorded velocity and position of spots during the actual recording process or in a pre-recording process.

"In the scanning type exposure apparatus according to the eleventh aspect of the present invention, the mask stage moves the mark pattern on the mask to the various positions in the illumination area, and the photoelectric detector detects the images (static images) of the mark pattern formed through the projection optical system. The images are formed by light beams passed through different optical paths in the projection optical system respectively. **The synchronization error detector detects the synchronization error comprising a synchronization discrepancy in stage velocity, a positional discrepancy of the photosensitive substrate in the Z direction, involved in movement of the mask stage and the substrate stage during actual scanning exposure, and a discrepancy in image formation state caused by vibration of the projection optical system**. The image formation state-computing unit can compute the image formation state of the image of the mark pattern to be formed under a condition of actual scanning exposure, by correcting the image formation states of the images of the mark pattern detected when the mark pattern is located at the respective positions in the illumination area, by using the detected synchronization error, and overlaying corrected images with each other."

It is absolutely clear that any error detection and correction proposed by Taniguchi is directed at measurement of the relative positions of the two stages, not the actual position of spots on the

imaging surface. The underlying processes are fundamentally different, even if scanning error correction is an underlying purpose of each invention.

The addition of Loopstra to attempt to correct the PTO identified discrepancy between the teachings of Taniguchi and the claimed invention not only fails to correct the actual deficiencies and differences identified in the Table above, but also reinforces the substantive content of those differences. The positioning device of Loopstra for "object holders" is described with respect to photolithography as:

> "The positioning device can be used in a lithographic device for the displacement of a semiconductor substrate relative to an exposure system of the lithographic device and for the displacement of a mask relative to the exposure system."
>
> **Abstract**

As can be seen, the system of Loopstra does not measure spot velocity or actual spot position on the exposure surface, but measures the relative displacement of subcomponents of the apparatus, much in the same way that Taniguchi measures the relative displacement of the reticule stage (RST and the wafer stage (WST) in the Taniguchi system.

As the addition of Loopstra fails to overcome the **actual deficiencies and discrepancies** between the claimed subject matter of the present application and the disclosure of Taniguchi, the rejection is clearly in error and must be withdrawn.

FILED ON BEHALF OF THE INVENTORS

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CERTIFICATE UNDER 37 C.F.R. 1.8: The undersigned hereby certifies that this Transmittal Letter and the paper, as described herein, are being sent by facsimile transmission or deposited in the United States Postal Service, as first class mail, with sufficient postage, in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450 on 4 JANUARY 2008.

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